

REMARKS

Reconsideration and withdrawal of the rejections of the application are respectfully requested in view of the amendments and remarks herewith, which place the application into condition for allowance, or at least in better condition for appeal.

I. STATUS OF CLAIMS AND FORMAL MATTERS

Claims 59-87 are under consideration in this application. Claims 1-58 have been cancelled; claim 59 is amended. No new matter is added by this amendment.

It is submitted that the claims, herewith and as originally presented, are patentably distinct over the prior art, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. The amendments of and additions to the claims, as presented herein, are not made for purposes of patentability within the meaning of 35 U.S.C. §§§§ 101, 102, 103 or 112. Rather, these amendments and additions are made simply for clarification and to round out the scope of protection to which Applicant is entitled. Furthermore, it is explicitly stated that the herewith amendments should not give rise to any estoppel, as the herewith amendments are not narrowing amendments.

II. THE REJECTIONS UNDER 35 U.S.C. §112, 1ST PARAGRAPH ARE OVERCOME

Claims 21-28 and 31-88 were rejected under 35 U.S.C. §112, first paragraph, as allegedly lacking adequate written description. The rejection is traversed.

The basis of the rejection is that the application does not contain written description for polynucleotides encoding amino acid transporters isolated from plants other than *Arabidopsis*. Claims 59-83 relate to a DNA molecule with a recited structure, in the form of sequences, and function, namely that of a plant amino acid transporter. The plant from which it is isolated is not relevant, as sufficient characteristics are recited in the claims to adequately describe the molecule. As is discussed in MPEP 2163, the written description requirement can be met “by disclosure of sufficiently detailed, relevant identifying characteristics which provide evidence that applicant was in possession of the claimed invention, i.e. complete or partial structure, other physical and/or chemical properties, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics.” The application teaches the complete structure of the claimed molecules, and teaches how to determine their function, using, for example, the assays described in Example 5. Therefore, written description exists for claims 59-83.

Claims 84-88 were included in the written description rejection, presumably because they are not limited to identifying nucleic acid molecules in *Arabidopsis* plants only. As was discussed in the Amendment filed on May 19, 2003, these claims are directed to the fact that the mutant yeast complementation system described by the Applicant can be used to screen any plant genome for sequences encoding amino acid transporters. Thus, as is evident to the skilled artisan, instead of the cDNA of young germ lines of *Arabidopsis thaliana*, as taught in Example 1, the cDNAs or genomic DNAs of any other species may also be used. Example 1 is embodied in claims 84 and 85. Accordingly, it is an advantage of the mutant yeast complementation system described by the Applicant that it is independent of the species from which the inserted DNA library fragments are derived. One of skill in the art could easily, without any undue experimentation, combine his own knowledge with the teachings of the application to identify isolated nucleic acid molecules encoding plant amino acid transporters, especially proline and histidine, e.g. those identified by the methods of claims 84 and 85 (as claimed in claims 86 and 87; see also claim 88). As is discussed in greater detail below, the attached Declaration by Dr. Marion Kwart, a person of skill in the art, confirms that the identification of a plant amino acid transporter using a yeast complementation assay, as taught in the instant application, can be and has been widely applied to various plant species.

Claims 84-88 claim a method for identifying a nucleic acid molecule encoding a plant amino acid transporter, and the specification uses the method, as claimed, to identify such a molecule, using *Arabidopsis thaliana* as an example. Therefore, written description clearly exists for these claims, as the claims are directed to what is described in the specification.

Claim 54 was rejected under 35 U.S.C. §112, first paragraph, as allegedly lacking adequate written description. The cancellation of claim 54 renders this rejection moot.

Claims 21-28 and 31-83 were rejected under 35 U.S.C. §112, first paragraph as allegedly lacking enablement. The rejection is traversed.

This rejection was reiterated “for the reasons of record set forth in the Official action mailed 11/19/2002.” Those reasons related to the breadth of the claims with respect to isolated DNA molecules encoding a plant amino acid transporter from any plant species, or that hybridize to SEQ ID NOs:1 and 3 or that complement a yeast transport mutation. (See page 6 of the November 19, 2002 Office Action.) Claims 21-58 have been cancelled, and claim 59 no longer

contains hybridization language. On that basis, claim 59 and its dependent claims (60-83) are enabled.

Although claims 84-88 have not been included in this rejection, the Office Action does raise questions about enablement with respect to the yeast mutant complementation system. The enclosed references demonstrate that the yeast complementation system described in the instant application can be, and indeed has been, used to identify amino acid transporters in various plant species. For example, Marvier *et al.* (1998) isolated a histidine transporter from *Ricinus communis*, using complementation of a yeast strain mutant in histidine uptake, as described in the application and claimed in claim 85. (See, in particular, the section of Marvier *et al.* beginning on page 323, col. 2, entitled “3.1. Complementation of a yeast mutant strain (2512c *ura3-52*) with the *Ricinus* cDNA library”.) Similarly, Schwacke *et al.* (1999) and Montamat *et al.* (1999) characterized proline transporters from *Lycopersicon esculentum* (tomato) and *Vicia faba* (broad bean), respectively, using complementation of yeast strains mutant in proline transport, as described in the application and claimed in claim 84. (See, in particular, the section of Schwacke *et al.* beginning on page 380, col. 2, entitled “Characterization of Transport Activity of LeProT1” and the section of Montamat *et al.* beginning on page 262, col. 2, entitled “Biochemical characterization”.) In addition, Tegender *et al.* (2000) identified an amino acid transporter in *Pisum sativum* (pea) that mediates transport of neutral, basic and acidic amino acids (see page 322, col. 1, section entitled “Functional Analysis of PsAAP1”). Recently, Popova *et al.* (2003) identified two amino acid transporters in *Mesembryanthemum crystallinum* (common ice plant), using both the proline and histidine transport defective yeast strains described in the present application. These studies clearly demonstrate that one of skill in the art could use the teachings of the specification to identify nucleic acids encoding amino acid transport proteins from a variety of diverse plants. No undue experimentation was required on the part of the researchers who undertook these studies; they achieved the expected results using the methods taught in the application.

A Declaration under 37 CFR 1.132 by Dr. Marion Kwart, one of skill in this art, attesting to the facts discussed above, is attached. As is demonstrated by the enclosed articles and the opinion of the skilled artisan, enablement existed to carry out the methods of claims 84-88, and they should therefore be allowable.

In fact, it is believed that the full scope of the claims meets the written description and enablement requirements of 35 U.S.C. §112, first paragraph. Accordingly, reconsideration and withdrawal of the rejections are requested.

III. THE DOUBLE-PATENTING REJECTIONS ARE OVERCOME

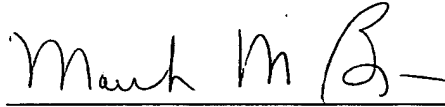
Claims 21-28 and 31-88 were rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1-22 of U.S. Patent No. 5,719,043. Claims 21-28 and 31-88 were rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1-25 of U.S. Patent No. 6,245,970. A terminal disclaimer with respect to both patents is attached, obviating the rejections.

CONCLUSION

Applicant believe that the application is in condition for allowance, and favorable reconsideration of the application and prompt issuance of a Notice of Allowance are earnestly solicited. Alternatively, consideration and entry of this paper is requested, as it places this application into better condition for purposes of appeal.

Respectfully submitted,

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